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tube; and when water has been admitted into the other, it is boiled over a lamp till all the air is expelled; and while the stream is still issuing with violence through the capillary extremity, the end of it is held in the flame of the lamp, till in proportion as the force of the steam diminishes, the heat acquires power to seal the tube hermetically.

When such an instrument has been successfully exhausted, if the empty ball be placed in a freezing mixture of salt and snow, the water contained in the opposite ball will be frozen solid in a very few minutes.

The first vapour being condensed by the common effect of cold, is immediately succeeded by a fresh emission, with proportional reduction of temperature; so that heat is continually withdrawn, or cold generated at a distance by the freezing cause.

*A Catalogue of North Polar Distances of some of the principal fixed Stars.* By John Pond, Esq. Astronomer Royal, F.R.S. Read December 17, 1812. [*Phil. Trans.* 1813, p. 75.]

*A Description of the solvent Glands and Gizzards of the Ardea Argala, the Casuarius Emu, and the long-legged Cassowary from New South Wales.* By Sir Everard Home, Bart. F.R.S. Read December 17, 1812. [*Phil. Trans.* 1813, p. 77.]

In the first of these birds the solvent glands are different from those of any other bird examined by the author, each gland being made up of five or six cells, that open into one common excretory duct; but its gizzard is very similar to that of the crow.

In the Emu the solvent glands are oval bags, one fourth of an inch in length, and one sixteenth wide. The gizzard differs from that of the crow in having a thicker lining, and is remarkable solely for its situation; for it is not placed, as usual, between the stomach and the duodenum, but forms a pouch on one side, so that food can pass onwards direct into the duodenum, without being received into the gizzard.

In the Cassowary of New South Wales, the solvent glands are similar to those of the emu, but larger; and the gizzard is also similar in every respect, but stronger.

The author further remarks upon the circumstances in the structure of the cassowaries, and other birds most nearly allied to them, which adapt them to the different degrees of fertility of the countries they inhabit.

The Emu of Java, where there is abundance of food, has intestines that are of large diameter, and comparatively short, so as to afford free passage to the superfluity of food they take, and a gizzard to be employed only occasionally.

The Cassowary of New South Wales has intestines of smaller diameter, thirteen feet long; and a stronger gizzard, more frequently employed in a less productive country.

The *Rhea Americana*, with intestines equally long, has a gizzard so placed, that no part of the food can escape trituration.

And lastly, the Ostrich of Africa, where its means of subsistence are most precarious, has a gizzard extremely strong, and intestines seventy feet in length.

*Additional Remarks on the State in which Alcohol exists in fermented Liquors.* By William Thomas Brande, Esq. F.R.S. Read December 17, 1812. [*Phil. Trans.* 1813, p. 82.]

The question here discussed, is whether alcohol exists in fermented liquors ready formed as the result of fermentation, or is formed subsequently from them by the process of distillation. The latter the author has imagined to be the commonly received opinion; and in a preceding communication to the Society he endeavoured to refute it, by showing that the same quantity of alcohol was always obtained, whether the distillation was performed at a higher or lower temperature. Since the conclusions which he then drew may be objected to on the ground that even the lowest temperature that he employed for distillation might be sufficient to give a new arrangement to the elements, and thereby form alcohol, he now employed a totally different process, in which distillation is altogether avoided.

Having observed that the unsuccessful attempts which had been made to separate alcohol from wines by subcarbonate of potash, and from which some persons had inferred its non-existence, appeared to fail in consequence of the union of the alkali with the colouring, extractive, and acid matters contained in the liquor, the author endeavoured, and has succeeded, in effecting a previous separation of these substances from wine, by means of subacetate of lead, or subnitrate of tin.

When these are added, a dense and copious precipitate is instantly formed; and if the liquor be then filtered, it passes perfectly colourless, containing alcohol, water, and a portion of the acid of the metallic salt employed.

By adding to this liquor half its quantity of subcarbonate of potash, nearly the whole of the alcohol that was contained in the wine is separated.

In Port wine thus treated, the quantity of alcohol was found to be  $22\frac{1}{2}$  per cent., agreeing very nearly with former results by distillation.

To these inferences respecting the apparent proportion of alcohol in Port and in other wines, it has been objected, that they do not possess a power of intoxicating equal to such a mixture of alcohol and water.

Mr. Brande's reply to this objection is, that it requires some time for a mixture of alcohol and water to become incorporated; and that in this state of imperfect union it is warmer to the taste, and apparently more heating in its effects than when sufficient time has been allowed for their mutual penetration.